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To

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On The

Science & Technology Workforce

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I'd like to begin by thanking Ranking Member Gordon and Representative Costello for inviting me and the IEEE-USA to participate in the House Science Committee's roundtable discussion on America's science and technology workforce — a vital resource for our future, which is facing increasing pressure and opportunities because of globalization. How America handles these impacts on the science and engineering workforce has a major impact the future economic and technological competitiveness of the United States and its security.

My name is Ron Hira and I am an Assistant Professor of Public Policy at Rochester Institute of Technology. I am co-author of the book, *Outsourcing America*, which chronicles all of these issues in more depth. I am presenting my remarks today on behalf of the Institute of Electrical and Electronics Engineers – United States of America (IEEE-USA). I am currently the Vice President for Career Activities of IEEE-USA's and have previously served as Chair of its R&D Policy Committee and Career and Workforce Policy Committees.

The Institute of Electrical and Electronics Engineers (IEEE) is a transnational technical and professional society made up of more than 380,000 individual members in 150 countries. The IEEE's primary purposes are to advance the theory and practice of electrical, electronics, computer and software engineering, improve the careers of our members and increase their ability to innovate and create wealth for the benefit of the societies in which they live and work.

IEEE-USA was established in 1973 to promote the professional careers and technology policy interests of IEEE's 225,000 US members.

Seventy percent of IEEE-USA's members work for private businesses, primarily in the aerospace and defense, biomedical technology, computers and communications, electrical and electronics equipment manufacturing and electric power industries. Thirty percent of these industry members work for firms with 500 or fewer employees. Ten percent of our members work for Federal, state and local governments. Another ten percent teach at American schools of engineering or work at non-profit research organizations. The remaining ten percent are self-employed and work as consultants to businesses and government.

Offshore Outsourcing And Offshoring Of Technology Jobs Is Having A Significant Impact On The US Workforce

No one nor any organization has reliable figures on exactly how many information technology and engineering jobs have moved offshore. Even without reliable figures, its negative impacts on the US technology labor market are already observable. Some of these effects include job displacement, wage depression, and discouraging young people from studying these disciplines in universities.

US electrical and electronics engineers and computer scientists have experienced higher levels of unemployment over the past five years compared to any similar time-span since IEEE-USA was established in 1973. And in 2003, for the first time in history, the unemployment rate for electrical and electronics engineers exceeded the national average. There are many reasons for the persistently high levels of unemployment for our nation's innovators, including the dot-com and telecom busts and the general business climate against hiring, as well as others. However, it is apparent that offshoring is a significant and growing cause of low demand for US high technology workers. While hiring has picked up in 2004 and 2005, it was not robust enough to offset the losses in previous years.

And engineers whose jobs are offshored during a poor labor market face extra burdens. They are more likely to be unemployed for an extended period of time, which means that they will lose the hands-on experience needed to keep up with the fast pace of technological change. Encapsulating the impact on workers, a popular saying is, "The half-life of an engineer is three to five years." If an engineer is out of work for one or more years then it is obvious that they will be losing skills much more rapidly than if they were in another occupation.

The poor labor market for electrical and electronics engineers and computer scientists is also causing wage depression. For the first time in the 31 years that IEEE-USA has been surveying our members, compensation actually declined in 2003.

Lastly, the poor labor market has caused young people to shy away from technology disciplines such as computer science in significant numbers. The Computing Research Association's Taulbee Survey found a more than 30% drop over the past two years in BS degree enrollments in computer science programs across the country. Even at top schools like MIT, the drop in electrical engineering and computer science enrollments was 33% over a two year time-span. Students are responding rationally to what they perceive as diminished long term prospects in these fields. While Microsoft Chairman, Bill Gates, reportedly laments the drops in Computer

Science enrollments, the reality is that his company only expanded its US workforce by 500 employees, or 1.4%, between 2003 and 2004. This pales in comparison to the rapid expansion of offshore outsourcers like Infosys which hires very few Americans. Infosys increased its workforce by 11,000 over the same period.

An offshoring study issued last week by the management consulting firm, McKinsey & Co., concluded that the impact of offshoring on the US workforce would be small and concerns about its impacts were “overblown.” Their conclusion is surprising because it is at odds with a prior McKinsey offshoring study which concluded that while the US economy as a whole would benefit, the US workforce would experience major losses in employment and wages.

It is important to note that McKinsey is an interested party in the offshoring discussion. It advises clients on how to offshore and NASSCOM, the Indian IT trade association, is one of its clients. The study itself, which is forecasting exercise, cannot be scrutinized by outside observers. It relies on proprietary data, its assumptions are not explicit, and no sensitivity analysis is reported. These are all essential elements for anyone to evaluate a forecast. The limitations of the McKinsey study points to an important void in our understanding offshoring and its impacts: the lack of objective data.

The negative developments caused by outsourcing are alarming, but they should not be surprising because they match what we would expect to find when high-skill jobs are offshored.

Offshoring's Effects Are Alarming But Not Surprising

Many economists believe that the amount of offshoring has little or no effect on the overall number of US jobs and the unemployment rate, at least in the medium run. They use a full employment model, so they assume that the US labor market clears eventually as displaced workers find their way back into the labor market.

However, most economists agree that offshoring causes the following: 1) job displacement for US workers; 2) a change in the mix of US occupations; and, 3) wage pressure for US jobs that are now tradable across borders.

There is little disagreement that some US workers will lose their jobs as their work shifts overseas. For example, just yesterday the Charlotte Observer reported that Wachovia Corporation told its US technology workers that many should expect to be laid off as their jobs are sent to India. Based on the full employment theory, economists hope those displaced workers will be reemployed rapidly and at substantially the same wages. It appears that this process, sometimes called ‘adjustment’, is not happening rapidly, or not at all, for thousands of displaced technology workers. The reason appears to be the unusually low levels of cumulative job creation in the economy over the past few years. Many have called our most recent recovery from recession, a job-less one. Unfortunately, there are few good explanations for why the recovery has not generated the number of jobs we would expect. Some have said that it is due to productivity increases, but that explanation is simply tautological.

The latest Bureau of Labor Statistics’ Displaced Worker Survey, released in January 2004, provides us some insight into the reemployment rates for workers. For workers who were

displaced between 2001-2003, it shows that 35% were unemployed in January 2004, and of the 65% who were employed, only 43% earned at least as much as they did before displacement. So, the empirical data do not support the economists' hope that displaced workers will be reemployed rapidly (one-in-three remain unemployed) and at substantially the same wages (three-in-five took pay cuts).

These results are mostly consistent with longer term results from the displaced worker surveys conducted from 1979 onwards. A large share of displaced workers remain unemployed for extended periods of time and even for those lucky enough to find work many take substantial pay cuts.

The second effect that economists predict is offshoring will cause a change in the mix of US occupations as some jobs migrate to more efficient (i.e., lower cost labor) locations. The thinking goes, as the US loses its engineering and other high skill jobs to more efficient locations, Americans will simply move into other occupations. However, there is no guarantee that the new mix of US occupations will be better after offshoring. In fact, no economist is able to explain the types of new jobs that will be created. Most, including Federal Reserve Chairman Alan Greenspan, have only given vague answers about the jobs of the future, saying that they will require higher skills. If we relinquish our engineering and computer programming jobs will we be able to replace them with better jobs? This is a key policy question that no one can answer.

It is also a very practical question that I get asked at nearly every IEEE meeting I attend. Invariably, someone asks, "What new job should I be training for? What skill sets do I need?" Unfortunately, I have no good answer for them, and I have yet to find a good one from anyone else. It is also a question that educators are grappling with. Engineering faculty want to adjust their curricula to make their students careers more immune to offshoring. Again, since companies have no reason to self-interested reason to reveal their offshoring plans, we are all left to speculate on what will go and what will stay.

The third predicted effect is wage depression in jobs that are now tradable across borders. As I mentioned earlier, these are already apparent in the IEEE-USA latest surveys. All of these effects, plus the lack of reliable data, are understandably creating a high degree of insecurity amongst US technology workers.

At the macroeconomic level, there is an on-going debate amongst economists whether offshoring is good for America. Nobel Laureate, Professor Paul Samuelson's recent article in the Journal of Economic Perspectives points out the very plausible situations where offshoring can actually make America worse off. Drs. Ralph Gomory and William Baumol show when these situations occur in their 2001 book, "Global Trade and Conflicting National Interest." Based on these important contributions we can conclude, contrary to the conventional wisdom, more trade does not guarantee a better outcome for America.

Keep in mind that these models are generally developed around simplifying assumptions. For example, they use two- or three-goods models and a limited number of trading partners. They do not explicitly take into account offshoring's impacts on technological innovation nor national security. America's economic growth is highly dependent on technological innovation, and that innovation cannot occur without a healthy and robust engineering labor market that attracts the best and brightest.

The Types Of Jobs Moving Offshore Are Increasing In Scale And Scope And Moving Up The Skill Ladder

Some have argued that only low level jobs are moving overseas. As one major news magazine put it, why should the US be concerned if ‘mind-numbing’ computer coding moves offshore. They argue that it simply frees up American workers to do more interesting tasks. This may comfort some but the empirical evidence does not support the notion that only low level tasks are moving offshore.

It is clear that high-level engineering design has begun to move offshore, and the primary driver is lower wage rates. Many top technology firms, such as Microsoft, Intel, Google and others, have created research & development centers in low-cost countries. Venture capital firms, what some consider the lifeblood of future innovation and sunrise industries, are increasingly asking the firms they fund to offshore as much as possible. I participated on the keynote plenary panel discussion in Silicon Valley at last summer’s IEEE Hot Chips conference, a conference that brings together designers of the most advanced integrated circuits. It should give you a sense of how important offshoring is when it is an a special event at the advanced chip designers’ annual conference. On the panel with me were two venture capitalists, Carl Everett from Accel Partners and Vinod Dham from NewPath Ventures, both of whom said that they were pressing the start-up firms they fund, firms that design advanced electronics, to offshore as much work as possible.

Another method for assessing the types of jobs moving offshore is by searching the job openings posted on the websites of major technology corporations such as Intel and Oracle and others. My preliminary analysis of these job sites shows many high level engineering openings at their Chinese operations. Many of these openings require advanced degrees and experience.

We are also seeing high-level non-engineering support functions move offshore. Professors Martin Kenney and Rafiq Dossani completed a revealing case study of a major US high-technology firm. The firm began to move some of its financial operations to its office in Bangalore in 2001. The move was so successful that they eventually made Bangalore the headquarters for many finance functions serving company offices around the world. Many of these functions require the highest skill levels. In their study, Kenney and Dossani found that moving the function to Bangalore reduced costs, reduced headcount and improved quality. Plus, they found that the company was able to ramp up the offshore process much more rapidly than they had even planned.

There is no doubt that there will be failures along the way, but it is clear that the overwhelming trend is for high-skill work to move offshore. One indicator of this is the remarkable growth of the offshore outsourcing companies.

The Offshore Outsourcing Companies Are Not Small Players, They Are Market Leaders

I have compared the financial reports for major IT services companies, and the results are striking. A summary table is below. It shows that two of the major Indian IT services companies, Infosys and Wipro, have market valuations higher than any other US based company, including Electronic Data Systems (EDS), Computer Sciences Corporation (CSC), and Affiliated Computer Services (ACS). In 2004, EDS had \$21 billion in revenue and about a \$10.3 billion market valuation while Infosys had only \$1.6 billion in revenue but a \$20.5 billion market valuation. In other words, **Infosys has twice the market capitalization of EDS on one-twelfth of the revenue**. This is important because IT services companies are generally priced based on revenues. The reason for the high valuation of the offshore outsourcers is quite simple: higher profit margins. **Infosys and Wipro have net profit margins of 31% and 20% respectively while EDS and CSC had net margins of 0.8% and 5.8%.**

	IT Services Business Models					
	<u>Traditional Model</u>			<u>Offshore Outsourcing Model</u>		
	<u>EDS</u>	<u>CSC</u>	<u>ACS</u>	<u>WIPRO</u>	<u>INFOSYS</u>	<u>COGNIZANT</u>
Market Cap (billions)	\$10.3	\$8.1	\$6.2	\$15.3	\$20.5	\$6.5
Employees	117,000	90,000	43,000	46,500	36,800	15,300
Sales (millions)	\$20,669	\$14,059	\$4,106	\$1,865	\$1,592	\$587
Net Profit Margin	0.8%	5.8%	12.9%	19.5%	30.8%	17.1%
Employee Growth	-11%	0%	8%	45%	43%	66%
Sales Growth	0%	-5%	8%	39%	50%	59%
Profit Growth	-109%	56%	73%	58%	53%	75%

Source: 2004 Annual Reports Submitted to US SEC

The Indian IT offshore outsourcers are not small players, they are the market leaders. And rapid sales growth, for Wipro it was 39%, results in rapid job growth, 45% or 14,500 new workers for Wipro. Infosys added as many employees in the last quarter, approximately 5,000, as it did in all of the previous fiscal year. It is common to see reports of plans to double staffs amongst the Indian IT outsourcers. It is not simply coincidence that the IT job market in India is red hot, while the US market languishes. Many of the jobs being filled in India are substituting for US workers.

The rapid growth has enabled the Indian IT companies to raise extraordinary sums from public offerings in the stock markets. At the same time many hailed Google's \$1 billion plus IPO last year, Tata Consultancy Services, the largest of the Indian IT firms, raised a similar amount on the Indian stock exchanges.

The Indian IT companies are able to earn significantly higher profit margins than their US counterparts, and therefore command higher price-to-sales and price-to-earnings ratios. The Indian firms have higher profit margins because: 1) they are using a higher proportion of offshore labor, 2) tax incentives provided by the Indian government, and 3) lax US government guest-worker visa programs that are exploited by the companies.

The profit margins on work that is performed offshore are higher, and since the Indian companies have a larger share of their staff located overseas, they earn higher profit margins than their US counterparts.

Adding to the profit margins, are Indian government tax holidays on any software or Business Process Outsourcing (BPO) export. This is observable in the effective tax rates for Infosys and Wipro, which were between 13% and 14%, while most US companies had tax rates of approximately 35%.

Lastly, US government guest-worker visa policies have been helping Indian IT firms win business. The two primary visa programs being exploited are the H-1B and L-1. The Indian IT firms use the H-1B and L-1 visa programs as a key part of their business model. The vast majority of their employees in the US are on one of these two work permits. They hire very few American citizens or permanent residents and in general do not sponsor their H-1B holders for permanent residence.

Conceptually, the H-1B visa program is designed to allow companies to hire foreign workers when American workers cannot be found with the necessary skills. In reality, they do not first have to see an American worker and can prefer a worker on an H-1B. The L-1 visa program was designed to allow companies to transfer workers with management roles or highly specialized knowledge from one branch of their company, located outside of the US, to an American facility. Both programs are being used in ways not intended by Congress. It is not just an issue of displacing US high-tech workers with H-1B and L-1 foreign workers with similar skills and at lower wages, the H-1B and L-1 programs are actually facilitating the export of US jobs and innovation.

Through these programs, enterprising foreign workers come to the US where they gain valuable experience and business contacts in their field. When their visas expire many of them go home to establish or work for new entrepreneurial businesses that compete in the US market. Former H-1B and L-1 employees have significantly enhanced the competitiveness of India's IT services companies. Moreover, as confirmed in a recent study by Hal Salzman of the Center for Industrial Competitiveness at the University of Massachusetts, H-1B workers are being hired specifically by these companies to help transfer IT and other business services to their overseas locations.

IEEE-USA would be pleased to work with industry in support of balanced reforms of the permanent immigration system. But so far the only immigration reform that industry has advanced is to expand the H-1b visa caps and exceptions, while also working to limit both H-1B and L-1 visa workforce protections. H-1B and L-1 visas may help employers find low-cost workers, but they do so in a manner that is unfair to both American and foreign workers. They are, in effect, a subsidy promoting the movement of American jobs overseas. Moreover, they undermine efforts to entice American students to embark on careers in engineering or the sciences by dimming the students' chances of finding and retaining technical jobs whose rewards are commensurate with opportunities in other employment sectors.

Due to their relatively low profit margins, US-based companies such as IBM, EDS and CSC are being forced to adopt the market leaders' business models. For example, EDS announced they were moving 20,000 jobs from high-cost to low-cost countries.

Indian IT firms, concerned about the entry of even lower cost providers from China, are opening operations there. India may be the first-mover, but many other developing countries are trying to replicate India's success. So, the supply of low-cost high-skill talent will continue to increase.

Companies Are Acting Rationally, But So Are Workers

By offshoring, company executives are pursuing what they believe is in the best interest of their shareholders. They believe that offshoring will improve their profits by cutting costs. Enough companies have done it successfully to induce most other major firms to attempt it. We are at the stage when major companies are moving from pilot offshoring programs to full deployment, and it is not unusual to hear of firms reaching 10,000 head counts in low-cost countries.

Executives should not be vilified for offshoring, since they are pursuing what they believe is in the best interest of the company. On the other hand, workers too are acting rationally by voicing their concerns about how offshoring will affect their livelihoods.

But as I said earlier, even mainstream economists agree that offshoring does not guarantee that the US will be better off. What is good for companies' bottom lines may not necessarily be good for America. We should be focused on designing policies that ensure the very best outcome for America not just what is in the interests of multinational firms.

One proposed policy is to compensate those who are adversely affected by offshoring. Unfortunately, the offshore outsourcing of high-skill jobs has a number of characteristics that make it hard to compensate those who are adversely affected:

- It is often difficult to directly identify workers who have been displaced, many of whom may not even know that they have been displaced because of trade. Companies are increasingly reluctant to reveal their plans for fear of the bad publicity that will result. Many workers are too intimidated to publicly identify themselves. They fear losing the severance package offered by their employers or that they will be blacklisted if they speak out.
- Even if we could identify those who have been adversely affected by trade, it is not clear how we should compensate them. Do we offer subsidized re-training in some other profession?
- Re-training and other types of assistance programs are very difficult to implement. Is it realistic to expect an electrical engineer with 20 years of experience to spend four years studying to become a nurse?

In sum, we think it is entirely misleading to describe offshore outsourcing as a "Win-Win" proposition for America and other countries, as offshoring advocates so often do. The burden should be placed on those advocates to demonstrate how workers who have been adversely affected will be compensated and helped to become productive citizens once again.

These advocates assume, as part of their argument, that displaced American workers will be reemployed. Instead of assuming, we should ensure that such workers are reemployed in equally high skill and highly paid positions.

Technological Innovation, Economic Growth and National Security Implications

America's economic competitiveness and national security is increasingly dependent on the superiority of our technology and technical know-how. There is a widespread belief -- almost a

blind faith among policy makers -- that as communications, semiconductor manufacturing, electronic devices and other key technological capabilities are off-loaded to other countries, the United States will just move on to the next field, to the next “big thing.”

Many observers, including government officials, argue that the next “big thing” is going to be nanotechnology, and that nanotechnology is going to generate enormous economic benefits and create many new jobs. We can only speculate on the impact that nanotechnology will have on the economy and jobs, and hope that it will be significant as some predict. However, we should not be complacent. As a nation, we are not alone in our pursuit of the frontiers of nanotechnology. China is currently the second largest producer of technical papers in nanoscience and nanotechnology, even ahead of Japan. With great cost advantages in addition to this advanced technical knowledge, we should anticipate that China will compete strongly for new nanotechnology jobs and manufacturing opportunities. China has also been increasing its science and engineering human capital at all levels, especially with a rapid increase in the number of Doctorate holders.

History tells us that technological catch-up can happen much faster than expected. Whether it was the Russia and China gaining Atomic capabilities very soon after us or the Russians beating us to space with Sputnik. We also underestimated the pace at which Japanese companies would move up the value chain in manufacturing. We are not guaranteed our technological lead.

The recent sale of IBM’s PC line to Chinese manufacturer Lenovo was a watershed event in the history of information technology. As it was designing its PC in 1979, IBM outsourced two critical components, the microprocessor to Intel and the operating system to Microsoft. They did this in spite of their in-house ability to produce the microprocessor and operating system. Clearly Intel and Microsoft have benefited the most from the PC revolution, and America as a country benefited since Intel and Microsoft kept most of their jobs in the US. Will America face the same fate as IBM as we outsource the critical components of our future to other countries?

U.S. manufacturing has also been hit hard by offshore outsourcing. This has important and serious consequences for US engineers and for technological innovation, economic growth and national security. Some wonder whether manufacturing matters very much since it only accounts for about 13% of the Gross Domestic Product. However, from a technological innovation point of view, manufacturing matters greatly. According to my recent calculations, in 2003 nearly 41% of American engineers work in the manufacturing. According to the National Science Foundation, the manufacturing sector accounts for a disproportionately high, 62%, of all research and development (R&D) in the US. With, the prevailing management approach to locate R&D as close to manufacturing production as possible, it is inevitable that as manufacturing moves overseas, both engineering work and R&D will follow.

More than a year ago, I dubbed the dialogue on offshore outsourcing as the New Competitiveness Debate because I think there are many lessons to be learned from the manufacturing competitiveness debate of the 1980s, which have been extensively chronicled by Dr. Kent Hughes in his recently book, *Building the Next American Century: The Past and Future of Economic Competitiveness*. The most important lesson is that it takes time and creativity to generate policy responses. There were many significant policy changes that improved the competitive position of the US including the creation of the Technology Administration. Many of the ideas came from the state and local levels, what policy academics often call the

“laboratories of innovation.” Some policies that were implemented might even be called protectionist, like voluntary quotas in the steel, automobile and semiconductor industries.

The key difference between the New Competitiveness Debate and the one in the 1980’s is that workers are being adversely affected rather than companies. That changes the feasible region and constraints on potential practical and politically palatable solutions, and I suspect makes it much more difficult to move forward. Many companies will be able to adapt to the new competitiveness challenge by substituting foreign for US labor. Even if they succeed against their competition it may be without US workers. The current competitiveness challenge has companies pitting US workers directly against foreign workers, as companies take the latest technology and capital to the lowest cost labor. This creates a practical problem because most of our established policy mechanisms are designed to help companies succeed. For example, increased government R&D spending may lead to breakthroughs in nanotechnology in the US, but the bulk of the job creation from design, development and production may happen overseas as companies take the latest tools, technologies and techniques to low-cost foreign labor. That means we need to create new mechanisms that are focused on US workers that differentiate them from their foreign counterparts. This is much more difficult than most people realize.

Policy Recommendations

The economic and employment challenges we will face caused by offshoring are complex. There are no easy answers or silver bullets in terms of public policy recommendations. However, there are some practical and immediate steps that we can take. I would note to date that the federal government has taken essentially no steps in response to this major economic structural change.

- The federal government must begin regularly tracking the volume and nature of the jobs that are moving offshore. We are pleased that Congressman Wolf earmarked a \$2 million study in last year’s omnibus spending bill. This should be viewed as a step in the right direction that more agencies should follow. We also commend Senator Joseph Lieberman for his report, “Data Dearth in Offshore Outsourcing: Policymaking Requires Facts.” We are concerned that the Commerce Department’s study has been completed for some time but is yet to be released.
- We need *different, not more*, engineers. The federal government must begin working with engineering professional societies and engineering faculty to explore how US engineers can differentiate themselves from foreign engineers. It is clear that US engineers cannot compete with engineers from low cost countries. In addition to the wage differential, companies are taking the latest tools and technologies to the foreign labor. Compounding all of these problems is the clandestine manner in which companies are shifting work offshore. For a US engineer to differentiate him- or herself, they need to know which jobs are going and which ones are staying. It is clear that more education does not make one immune from offshoring. We need engineers who have a different set of skills.
- The federal government must make post-graduate engineering education attractive to US citizens and permanent residents by offering targeted scholarships with stipends high enough to attract the best and brightest. We should continue to recruit the best and brightest students from abroad but we should also recognize they have many more options because of offshoring. Foreign students who study here are finding

better opportunities at home and many of the best and brightest are eschewing graduate work in the US for better opportunities at home. It is obvious that we will have to become less reliant on foreign students to fill our graduate engineering programs. Because the opportunity costs for domestic students are much higher than their foreign counterparts, new and targeted scholarships for domestic students should be priced high enough to attract the best and brightest US students to advance their education.

- Companies should be required to give adequate notice of their intentions to move work offshore so that the displaced employees can make appropriate plans to minimize the financial hardship, and government support agencies can prepare to provide the necessary transition assistance.
- Congress should rethink how U.S. workforce assistance programs can be designed to help displaced high-tech workers become productive again. We are in a new era of work and lifelong learning, and new and more flexible methods are needed to provide meaningful assistance.
- Congress should strengthen H-1B and L-1 workforce protections and their enforcement to ensure that the programs serve their respective purposes without adversely affecting employment opportunities for U.S. high-tech workers.
- Fundamental changes in U.S. immigration law, such as those incorporated in the recent Chile and Singapore Free Trade Agreements, should be made by Congress, and not by trade negotiators.
- Congress should take affirmative steps to ensure that the U.S. retains the domestic human resource and production capabilities needed to develop and utilize technologies deemed critical to U.S. national and homeland security.
- As globalization narrows U.S. technology leadership, the Department of Defense and other government security agencies will need to enhance their ability to acquire and assimilate foreign technologies.
- The U.S. needs a coordinated national strategy designed to sustain its technological leadership and promote job creation in response to the concerted strategies being used by other countries to attract U.S. industries and jobs. Senator Joseph Lieberman's proposal to create a Presidential Commission on the implications of outsourcing is a step in the right direction.